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Improved processing of hetero atom-contg. high mol.wt.polymers - by melt-mixing with a cpd. having three or more functional gps. (Eng)

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The processing characteristics of polymer compsns. are improved in that the polymer has hetero atoms in the chain and is melt mixed with 0.05-5 wt.% of a cpd. having at least 3 functional gps.

A polymer compsn. obtd. by the process is also claimed, as is a moulding produced with the compsn.

USE

In the processing of high mol.wt. and/or highly-filled compsns. comprising (co)polymers contg. heteroatoms, pref. with low branching levels.

A(8-M6, 11-A3, 12-B1)

ADVANTAGE

The additives provide a substantial reduction in melt viscosity without affecting the mechanical props. of mouldings produced. Compsns. contg. impact modifiers show improved flow besides an increase in impact resistance and elongation at break.

PREFERRED EMBODIMENTS

Pref., the hetero atoms are from O, N and S;and the polymer is from: polyamides, pref. obtd. by ring opening polymerisation of lactones or by polycondensation of alpha-omega amino acids; polyurethanes; polyesters, pref. obtd. by ring opening polymerisation of lactones; polyimines; polyoxy alkylene cpds.; and their copolymers; pref. with number average mol. wt. 1000-100000.

The tri-functional cpd. pref. has gps. from (substd.) OH, thiol, (carboxy) acid, nitrile, isocyanate, imine and amine (yielding) gps., pref.. being triazine trisamino acid derivs., esp. 2,4,6-triamino caproic acid-1,3,5-triazine, and aromatic tricarboxylic acids, esp. 1,3,5-tribenzene tricarboxylic acid. With polyamides, the tri-functional cpd.

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is pref. a tris- or higher functional amine or imine; with polyesters, it is pref. such an amine or imine, or contains 3 or more OH gps.; with both polyamides and polyesters, the cpd. is pref. dendrimeric.

The compsns. pref. further contains a filler and an impact modifier.

EXAMPLE

Polyamide 6 was melt-mixed under N_2 with 5 wt.% of the first generation dendrimer 4-cascade diaminobutane[4]:propylamine (N,N′-tetrabis(3-aminopropyl)-1,4-butane diamine) ($DAB(PA)_4$) and extruded. Die head press. was 2 (13) bar and moment 35 (77) Nm. The granulate had melt viscosity 170 (2700) Pa.s and was injection moulded into test bars at an injection press. of 50 (120) bar, the bars having Izod (23 deg.C) 5.6 (6.4) kJ/M^2 and E-modulus 2650 (3000) N/mm^2 (polyamide 6 contg. no $DAB(PA)_4$ in brackets). (JS)
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